The opinion in support of the decision being entered today was ***not*** written for publication and is ***not*** binding precedent of the Board.

Paper No. 35

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex Parte SURAJ PURI,
JOSEPH MEDEIROS, JR.
and RAJ MOHINDRA

Appeal No. 2004-0138
Application No. 09/311, 800

ON BRIEF

Before GARRIS, OWENS and JEFFREY T. SMITH, ***Administrative Patent Judge.***

JEFFREY T. SMITH, ***Administrative Patent Judge***.

DECISION ON APPEAL

Applicants appeal the decision of the Primary Examiner's refusal to allow claims 5, 14, 15, 17, 39 and 44-48.[1] We have jurisdiction under 35 U.S.C. § 134.

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[1] In rendering our decision, we have considered Appellants' arguments presented in the Brief, filed March 17, 2003 and the Reply Brief, filed August 7, 2003.

THE INVENTION

The Appellants' claimed invention relates to a method of cleaning the surface of a microelectronic device. The claimed method comprises progressively immersing the substrate in a cleaning fluid that includes ultradilute ammonia chemistry to clean the microelectronic device. (Brief, p. 7). Claim 14 which is representative of the invention is reproduced below:

> 14. A method of cleaning a surface of a microelectronic device at a stage of manufacture, comprising the steps of:
>
> providing a cleaning liquid comprising a concentration of aqueous ammonia that is sufficiently dilute with respect to the aqueous ammonia such that the cleaning liquid is substantially non-etching with respect to the surface of the device;
>
> positioning the device in a vessel;
>
> introducing the cleaning liquid into the vessel under conditions effective to help clean the surface of the device, wherein the step of introducing the cleaning liquid to the vessel comprises progressively immersing the device in the cleaning liquid; and
>
> while the device is progressively immersed, transferring acoustic energy to the cleaning liquid.

As evidence of unpatentability, the Examiner relies on the following references:

Fujikawa et al. (Fujikawa)	5,520,744	May 28, 1996

Olesen et al. (Olesen)	5,656,097	Aug. 12, 1997

Kern et al., "Handbook of Semiconductor Wafer Cleaning Technology", pg. 49-52, 1993

THE REJECTIONS

The Examiner rejected claims 5, 14, 15, 17, 44-46 and 48 under 35 U.S.C. § 103(a) as obvious over the combination of Resnick, Kern and Olesen; and claims 39 and 47 under 35 U.S.C. § 103(a)as obvious over the combination of Resnick, Kern, Olesen and Fujikawa.[2] (Final Rejection, pp. 3-7).

OPINION

Upon careful review of the respective positions advanced by Appellants and the Examiner, we find ourselves in agreement with Appellants' position in that the Examiner has failed to carry the burden of establishing a ***prima facie*** case of obviousness. ***See In re Oetiker,*** 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); ***In re Piasecki,*** 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). Accordingly, we will not sustain the Examiner's rejections. We will limit our discussion to independent claims 14 and 44.[3]

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[2] According to the Examiner, the rejection under 35 U.S.C. § 112, second paragraph, has been withdrawn. (Answer, p. 2).

[3]The Examiner did not cite the Fujikawa reference in the rejection of claims 14 and 44. Thus, we will not include a discussion of this reference in our decision.

We find claims 14 and 44 are directed to a method of cleaning a surface of a microelectronic device at a stage of manufacture. The method comprising the steps of positioning the device in a vessel, introducing a cleaning liquid to the vessel and progressively immersing the device in the cleaning liquid. Acoustic energy is transferred to the cleaning liquid while the device is progressively immersed. The cleaning fluid is described as having a concentration of aqueous ammonia that is sufficiently dilute with respect to the aqueous ammonia such that the cleaning liquid is substantially non-etching with respect to the surface of the device. Appellants disclose that the phrase substantially no etching means that 10 angstroms or less of the native oxide is etched by the cleaning liquid. (Specification, pp. 7-8).

The Examiner rejects the subject matter of claims 14 and 44 over the combination of Resnick, Kern and Olesen. According to the Examiner, Resnick teaches immersing wafers in a megasonic bath containing an ultradilute SC-1 cleaning compositions that comprise 1-1000ppm ammonia and hydrogen peroxide. Kern teaches reducing the ammonia concentration in SC-1 cleaning composition eliminates roughening and enhances removal of particles. The Examiner relied on the Olesen reference for teaching progressively immersing a device in an ammonia cleaning liquid while applying megasonic energy. (Final Rejection, p. 4). The Examiner concluded that it would have been obvious to apply acoustic energy, as taught by

Olesen, to a wafer in the megasonic bath, taught by Resnick, containing the reduced ultradilute SC-1 cleaning, taught by Kern. (Final Rejection, p. 5).

We reverse. We are in complete agree with the Appellants, Brief pages 19-31, that the combination of Resnick, Kern and Olesen fails to teach the claimed method. The Examiner relies on Kern for teaching the use of a dilute cleaning solutions. The Examiner never asserts that the cleaning solution of Kern is "substantially non-etching with respect to the surface of the device" as required by claims 14 and 44. The specification discloses that non-etching means that 10 angstroms or less of the native oxide is etched by the cleaning liquid. The Examiner has not indicated that this property is inherent in the cleaning solution of Kern. Appellants have argued that the cleaning solution of Kern is too concentrated to be substantially non-etching as required by claims 14 and 44. (Brief, p. 31). The Appellants referred to the Miyashita and Meuris documents, cited in the Kern reference, in support of his argument. The Examiner has chosen not to address these documents in the answer. (Pages 8-9). Moreover, we recognize that Kern discloses that the Meuris reference does not support the teaching of eliminating roughening and enhanced removal of particles. (Kern, footnote page 49). The Examiner has also not addressed this disclosure in the reference.

For the foregoing reasons and those stated in the Briefs, we determine that the Examiner's conclusion of obviousness is not supported by facts. "Where the legal conclusion [of obviousness] is not supported by facts it cannot stand." ***In re Warner,*** 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967).

CONCLUSION

The rejections of claims 5, 14, 15, 17, 44-46 and 48 under 35 U.S.C. § 103(a) over the combination of Resnick, Kern and Olesen; and claims 39 and 47 under 35 U.S.C. § 103(a) over the combination of Resnick, Kern, Olesen and Fujikawa are reversed.

REVERSED

BRADLEY R. GARRIS ***Administrative Patent Judge***	)
TERRY J. OWENS ***Administrative Patent Judge***	) **BOARD OF PATENT**) **APPEALS AND**) **INTERFERENCES**
JEFFREY T. SMITH ***Administrative Patent Judge***	)

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